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Contact: Linda McCandless, llm3@cornell.edu, 315-787-2417

Geneva Researchers Bring Precision Disease Management to New York Vineyards

by Peter Seem

GENEVA, NY: New York's grape industry is second only to apples as the state's largest fruit crop and is valued at $45.9 million. But this industry, and thousands of jobs with it, labor under the shadow of Guignardia biwelli, the fungus that causes black rot-one of the most serious diseases of grapes in the Eastern United States.

Plant pathologist Wayne Wilcox led the Cornell research team that re-evaluated the spray programs grape growers use to control black rot.
CREDIT: NYSAES/Cornell

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"If we didn't get good control of black rot, we couldn't grow grapes in New York," said Wayne Wilcox, Cornell University professor of plant pathology at the New York State Agricultural Experiment Station, in Geneva, NY.

Fortunately for growers, grape juice drinkers, wine connoisseurs, and the state of New York, black rot can be effectively controlled. But the traditional control strategy-applying as many as eight fungicide sprays at regular intervals from mid-May until August-was not good enough for Wilcox and fellow Experiment Station pathologists David Gadoury and Robert Seem.

The three plant pathologists turned their attention to a control strategy Wilcox describes as "overkill." "We started looking at spraying more critically, asking growers 'when do you really need to spray?' " he said.

After six years of painstaking research conducted in cooperation with graduate student Lisa Hoffman and

technician Duane Riegel, the team is now able to provide growers with a detailed understanding of the biology of the disease and various factors that impact its control. These include when grapevines are most susceptible to the disease, when the disease is most susceptible to the fungicides used against it, the specific traits of these individual fungicides, and precisely when the vineyards should be treated to provide best control. They also proved what has long been suspected, that sanitation-removal of diseased tissues from the vine during the dormant pruning process-is an extremely valuable component of an integrated management program.

Their conclusion? An excellent level of control, the same as with the six-to eight-spray program, can be achieved with just two or three fungicide sprays, depending on the season provided that standard sanitation practices are employed in the vineyard. The conventional approach was to begin spraying when there were three to five inches of shoot growth, around the middle of May, and continue into August. The latest recommendation is to spray once at the start of bloom and once or twice more at two-week intervals. Additional sprays may be needed to manage other diseases, depending on the grape variety and the year.

In the final stages of black rot infection, grapes shrivel and become small, black and hard. Shoots, stems and tendrils can also be infected. CREDIT: NYSAES/Cornell

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Reducing the frequency, and thus the total amount, of applied pesticide has environmental and economic benefits. It saves the growers money, both in the cost of pesticide and the cost of labor, and reduces the amount of chemicals introduced into the environment. Reducing spray frequency also helps prevent fungicide resistance, and ensures that these materials will still be able to control black rot for years to come.

In the annually revised publication, New York and Pennsylvania Pest Management Recommendations for Grapes, research and extension personnel from the region develop and disseminate the most current guidelines for disease control. While other states' official recommendations call for the same strategy New York used a decade ago, this region's guidelines have been continually refined as a result of the work of these Cornell researchers.

Tim Martinson, director of the Finger Lakes Grape Program in Penn Yan, works directly with growers in New York. He says Wilcox's program is an excellent one. In addition to writing much of the Recommends, Wilcox writes an extensive yearly report outlining the most up-to-date research results and detailed strategies for controlling all of the major diseases grape growers face in New York. Martinson distributes this report to growers, who, he says, put it to use right away.

"Growers in the regions have grown accustomed to receiving this kind of information every year, but, the reality is, the growers in this area have very sophisticated disease management techniques [because] the plant pathology department at Geneva does an

excellent job of getting out information," said Martinson. Those techniques are paying off with cleaner, better fruit than was grown in the past.

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